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“Step Out From the Old to the New”

IS 15069 (2001): Oil of Cuminseed [PCD 18: Natural and Synthetic Fragrance Materials]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
क्यूमिनसीड का तेल — विशिष्टि

Indian Standard
OIL OF CUMINSEED — SPECIFICATION

ICS 71.100.60

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Natural and Synthetic Fragrance Materials Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

This Indian Standard is based on data as available from Spice Board and some Indian manufacturers of oil of cuminseed. Oil of cuminseed is obtained by steam distillation of the seeds of *cuminum cyminum* Linnaeus.

Chromatographic profile as shown in Table 2 is based on data as available from Indian manufacturers and has been included in the standard keeping in mind the recent practices being adopted by ISO for formulation of Standards on essential oils.

At present, no ISO standard on oil of cuminseed is available. However, an International Standard (ISO) on oil of cuminseed is being developed by ISO/TC 54 responsible for formulation of ISO Standard on essential oils.

The composition of the Committee responsible for formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the values, the final value, observed or calculated expressing the result of a test of analysis, it shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

OIL OF CUMINSEED — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for oil of cuminseed.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this test constitute the provisions of the standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
326	Methods of sampling and test for natural and synthetic perfumery materials
(Part 1) : 1984	Sampling (<i>second revision</i>)
(Part 2) : 1980	Preliminary examination perfumery materials and samples (<i>second revision</i>)
(Part 3) : 1980	Determination of relative density (<i>second revision</i>)
(Part 4) : 1980	Determination of optical relation
(Part 5) : 1986	Determination of refractive index (<i>second revision</i>)
(Part 6) : 1986	Determination of solubility in ethanol (<i>second revision</i>)
(Part 11) : 1980	Determination of carbonyl value and content of carbonyl compounds (<i>second revision</i>)
(Part 19) : 1998	Gas chromatographic analysis of perfumery materials
1070 : 1992	Reagent grade water (<i>third revision</i>)
2284 : 1988	Method for olfactory assessment of natural and synthetic perfumery materials (<i>second revision</i>)
6597 : 2001	Glossary of terms relating to natural and synthetic perfumery materials (<i>second revision</i>)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 6597 shall apply.

4 REQUIREMENT

4.1 Description

4.1.1 The volatile oil shall be obtained by steam

distillation of the seeds of *Cuminum cyminum L.*

4.1.2 The oil of cumin shall be a clear, mobile liquid free from sediment, suspended matter, separated water and added adulterants, when tested as per IS 326 (Part 2).

4.2 Solubility in Ethanol

Material is completely soluble in eight volume of ethanol (80 percent by volume) when tested as prescribed in IS 326 (Part 6).

4.3 The material shall also comply with the requirements given in Table 1 and Table 2.

4.4 Chromatographic Profile

Analysis of the essential oil shall be carried out by Gas Chromatography (*see Annex A*). In the chromatogram obtained, the representative and characteristic components shown in Table 2 shall be identified. The proportions of these components indicated by the integrator shall be as shown in Table 2. This constitutes the chromatographic profile of the essential oil.

5 PACKING AND MARKING

5.1 Packing

5.1.1 The material shall be supplied in well closed 50, 25, 10 kg high density polyethylene (HDPE) drums or 5 kg aluminium containers, permitting a minimum of air space, as agreed between the purchaser and the supplier.

5.1.2 The material shall be well protected from the light and stored in a cool, dry place.

5.2 Marking

The containers shall be marked with the following information:

- a) Name of the material;
- b) Manufacturer's name and address and/or his recognized trade-mark, if any;
- c) Net mass of the material;
- d) Month and year of manufacture;
- e) Batch number;
- f) Shelf life; and
- g) Other cautionary notice, if any.

Table 1 Requirements for Oil of Cuminseed
(Clauses 4.3 and 7.1)

Sl No.	Characteristics	Requirements	Method of Test, Ref to IS
(1)	(2)	(3)	(4)
i)	Colour and appearance	Colourless to pale yellow liquid when fresh, with a tendency to darken to deep yellow colour on storage	326 (Part 2)
ii)	Odour	Strongly aromatic, spicy, warm persistent characteristic of cumin	2284
iii)	Relative density at 27°C ¹⁾	0.868 8 - 0.918 7	326 (Part 3)
iv)	Optical rotation at 27°C	+1° to + 8°	326 (Part 4)
v)	Refractive Index at 27°C ¹⁾	1.479 2 - 1.509 2	326 (Part 5)
vi)	Carbonyl content, percent by mass (calculated as cuminaldehyde)	15 - 33	326 (Part 11)

¹⁾ The correction factor for relative density [see IS 326 (Part 3)] and refractive index [see IS 326 (Part 5)] for each degree celsius change in temperature is 0.000 64 and 0.000 38 respectively.

Table 2 Chromatographic Profile
(Clauses 4.3, 4.4 and 7.1)

Components	Minimum	Maximum
(1)	(2)	(3)
Pinene-beta	4.5	17.0
Gamma-terpinene	11.0	34.0
Para cymene	23.0	32.0
Cumin aldehyde	15.0	33.0
Perilla aldehyde	5.0	20.0

6 SAMPLING

Representative samples of the materials, each sample

containing not less than 50 ml shall be drawn as prescribed under IS 326 (Part 1).

7 TESTS

7.1 Test for the determination of all the characteristics shall be conducted on the composite sample as prescribed in 4.1, 4.2, Table 1 and Table 2.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water shall be used in test (see IS 1070).

NOTE — ‘Pure chemicals’ shall mean chemicals that do not contain impurities which affect the result of the analysis.

ANNEX A

(Clause 4.4)

GAS CHROMATOGRAPHIC ANALYSIS OF OIL OF CUMINSEED

A-1 GENERAL

The chromatographic analysis is given on capillary column. The chromatographic conditions given here are for information and guidance.

A-2 PROCEDURE

A-2.1 The analysis shall be done as per IS 326 (Part 19). The typical chromatograms for oil of cuminseed in capillary column with the following chromatographic conditions shown in Fig. 1, Fig. 2 and Fig. 3.

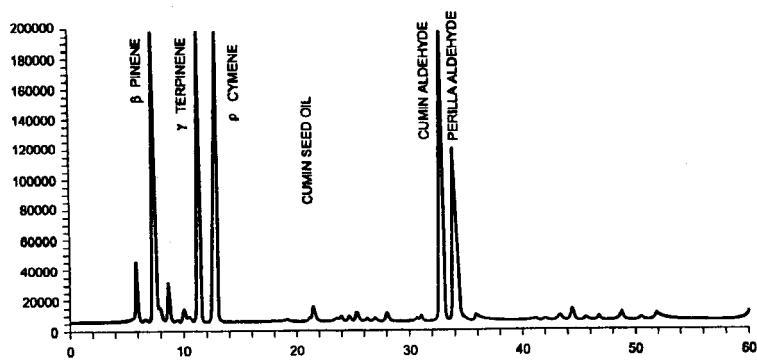


FIG. 1 OIL OF CUMINSEED — TYPICAL CHROMATOGRAM

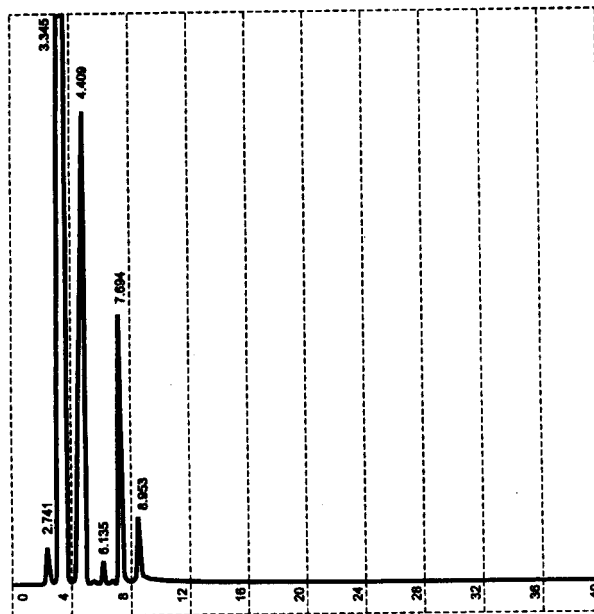


FIG. 2 OIL OF CUMINSEED — TYPICAL CHROMATOGRAM

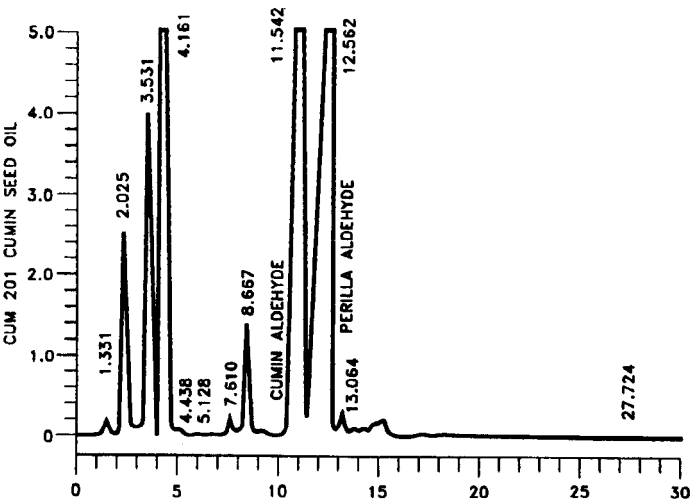


FIG. 3 OIL OF CUMINSEED — TYPICAL CHROMATOGRAM

A-2.1.1 Capillary Column – Polar

Column HP-FFAP

- | | |
|---------------|------------------------|
| a) Size | 50 m × 0.2 mm × 0.2 μm |
| Carrier gas | Nitrogen |
| Flow rate | 30 ml/min |
| Head pressure | 207 kPa (30 psi) |

Conditions

- | | |
|-------------------------------|----------|
| a) Oven temperature | 60-220°C |
| b) Ramp | 3°/min |
| c) Injection port temperature | 230°C |
| d) Time | 20 min |

Detector

- | | |
|----------------|-------|
| a) Type | FID |
| b) Temperature | 250°C |
| Split | 120:1 |

Volume of the sample 0.2 μl

A-2.1.2 Capillary Column — Non-Polar

Column DB-1 (Non-polar)

- | | |
|-------------|-----------|
| a) Length | 30 m |
| b) I.D. | 0.25 mm |
| Carrier gas | Nitrogen |
| Flow rate | 30 ml/min |

Conditions

- | | |
|-------------------------------|-----------|
| a) Oven temperature | 100-220°C |
| b) Ramp | 5°/min |
| c) Injection port temperature | 230°C |
| d) Time | 20 min |

Detector

- | | |
|----------------|-------|
| a) Type | FID |
| b) Temperature | 250°C |

ANNEX B*(Foreword)***COMMITTEE COMPOSITION****Natural and Synthetic Fragrance Materials Sectional Committee, PCD 18**

<i>Organization</i>	<i>Representative(s)</i>
Bush Boake Allen (India) Ltd, Mumbai,	DR G. S. RANADE (<i>Chairman</i>) SHRI A. BEWOOR (<i>Alternate</i>)
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Member-Secretary

SHRI T. KALAIVANAN

Joint Director (PCD), BIS

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This Indian Standard has been developed from Doc : No. PCD 18 (1652).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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